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(54) VERIFYING DEVICE FOR SERVO PATTERN OF TAPE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a device for verifying the recording failure of a servo pattern which is made to the reference when a data track on a tape used for a recording/reproducing device is traced by a head.

SOLUTION: The servo pattern 12 is formed on the tape 2 as the pattern having the determined dimension. The tape 2 is run by a tape driving device 1. The servo

pattern 12 recorded on the tape 2 is reproduced by a reproduction head 6. The reproduction head 6 is moved in the breadthwise direction of the tape 2 by a head

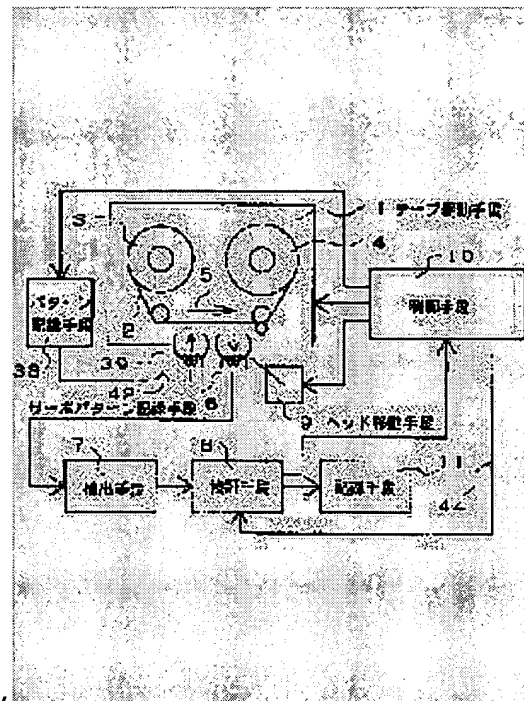
moving means 9. By the reproduction head 6, the reproduction is made for every one part of the recording

width W of the servo pattern 12 while changing the height. A signal of the reproduction head 6 is detected by

a detection means 7, and the recording failure is verified by a verifying means 8 based on the signal of the detection means 7. At this time, the position of the reproduction head is also

detected by the verifying means 8 while making the longitudinal direction of the tape 2 to an X-axis, the breadthwise direction to a Y-axis. By a recording means 11, the positional

information with the X-axis or Y-axis is also recorded in relation to the verifying result.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is the pattern of the signal recorded on the tape, and relates to the record pattern test equipment of the tape which inspects especially a servo pattern.

[0002]

[Description of the Prior Art] A tape medium or the magnetic tape only called a tape is used dozens of years before widely as a record medium of the data of a computer by computer business, and it has resulted in current. The medium for record needs to fulfill the demand item from many commercial scenes, such as endurance, storage capacity, dependability, a price, a preservation property, and record reproduction speed, for the data of a computer. Furthermore, the numeric value of those demand items becomes altitude every day. The recording device of a tape and a tape is repeating technical amelioration, whenever a demand item becomes altitude, and it has fulfilled those demand items.

[0003] To the tape transport and tape for making it run a tape, a signal is recorded or the recording device of a traditional tape consists of the record playback sections for reproducing the signal recorded on the tape. The record playback section contains a transducer slack recording head and the reproducing head. A recording head changes change of a current into a magnetic change, and forms a magnetization pattern on a tape. The reproducing head detects change of the MAG of a tape. A recording head and the reproducing head are arranged so that it may be on a tape transport and the tape it runs may always be contacted.

[0004] The storage capacity per unit area of a tape is improvable by some approaches among the demand items of a large number to the recording device of a tape. One is amelioration of the recording density of the information on the longitudinal direction of a tape, and other one is the recording density of the information on the cross direction of a tape. In order to raise the recording density of the longitudinal direction of a tape, it is obtained by the amelioration of the material of the magnetic substance and the amelioration of the formation technique of the magnetic substance of the front face of a tape which constitute a tape.

[0005] On the other hand, the improvement in the recording density of the cross direction of a tape is attained by dividing a tape finely crosswise. That is, in order to raise the recording density of the cross direction of a tape, one tape is divided into the long and slender partition called a truck, and high recording density is obtained by making this number of partitions fine. However, if track density is made fine, it has influence on the dependability which is other demand items required, for example of a tape, and cannot be made actual not much fine. This cause is because it becomes difficult to guarantee that the magnetic head repeats a truck and traces certainly, when track density is raised too much.

[0006] Then, the technique controlled so that the magnetic head always follows a truck with a servo technique is proposed by recently combining with the mechanism which moves the magnetic head crosswise [of a tape]. If this technique is used, track density of the recording device of a tape may be able to be made high by leaps and bounds.

[0007] For example, the technique about the recording device of the tape which used the servo technique

is indicated by JP,08-30942,A (G11 B5/584). A special tape and a special tape drive are used for the equipment shown here.

[0008] The tape on which the servo pattern was recorded beforehand is first used for a tape. A servo pattern is the reference signal of the special pattern written in along with the longitudinal direction of a tape. A servo pattern is the combination of A pattern which made the transit direction of a tape 0 times and inclined to 84 degrees, and B pattern leaning to 96 degrees. Since include angles differ, when A pattern and B pattern are reproduced by the reproducing head with playback width of face narrower enough than the recording width of a servo pattern, the timing between A pattern and B pattern differs in the location of the cross direction of the tape of the reproducing head. By the difference in this timing, the location of the reproducing head which is reproducing the servo pattern is detectable.

[0009] This servo pattern is the plant of a tape, and in order to write in a servo pattern, it is written in by the servo pattern write-in equipment designed specially. After a tape is shipped from works, the servo pattern written in once has disappeared enough and is not rewritten again. Although how to write in a servo pattern may be optically written to be the case where it writes magnetically, the example which the example indicated by previous reference writes magnetically is shown.

[0010] Next, the tape drive which uses the tape on which the servo pattern was written in has the description in the part of the magnetic head. The reproducing-head part in which the magnetic head reads only a servo pattern, and two parts of the data head part which performs writing and reading of the usual data are formed in one. Moreover, the magnetic head is movable to the cross direction of a tape. The reproducing head reads the servo pattern currently recorded on the tape, while the tape is running. If the reproducing head reads the information on a servo pattern, a tape drive can detect the absolute location to the servo pattern of the reproducing head. The driving gear of a tape positions the reproducing head with a servo technique to a servo pattern so that the location of the reproducing head may turn into a position. Therefore, the reproducing head becomes possible [always maintaining an exact location to a servo pattern]. Consequently, it becomes possible to make very high track density of the information which records data or is reproduced.

[0011] The important element in the recording apparatus of the tape which used the technique of making this magnetic head following the truck on a tape with a servo technique is in the point how to form the servo pattern of a tape correctly. The reason is that the servo pattern on a tape serves as criteria of all actuation of the recording device of a tape. Therefore, the manufacturer who manufactures a tape is asked for guaranteeing high record quality without the accuracy and the record defect of a physical dimension of the servo pattern formed on the tape.

[0012]

[Problem(s) to be Solved by the Invention] The servo pattern of the tape used with the recording apparatus of the tape using the conventional servo pattern was difficult to verify the record condition. This invention offers the verification equipment of the servo pattern of the tape which can verify the record condition of the servo pattern recorded on the tape.

[0013]

[Means for Solving the Problem] In the verification equipment of the servo pattern of the tape for verifying the record condition of the servo pattern which consists of a pattern of the specific dimension recorded on the tape The control means which controls the whole equipment, and the tape driving means for making it run said tape, The transducer which detects the signal of said tape to said servo pattern from said tape it is running by width of face narrower than the width of face of the pattern of said servo pattern, A detection means to detect the servo pattern signal corresponding to said servo pattern based on the signal outputted from said transducer, A verification means to verify the record condition of said servo pattern based on said servo pattern signal outputted from said detection means, It consists of transducer migration means to which said transducer is moved to said servo pattern so that the playback location of the cross direction of said servo pattern may change by moving said transducer based on the migration control signal outputted from said control means. Let said verification means be verification equipment of the servo pattern of the tape characterized by making it relate to the playback location of the cross direction of said servo pattern by said transducer, and verifying the record condition of said

servo pattern.

[0014] Moreover, let said verification means be verification equipment of the servo pattern of the tape which verifies the record condition of a servo pattern by detecting the record defect of the servo pattern signal outputted from said detection means.

[0015] Moreover, let said verification means be verification equipment of the servo pattern of the tape which detects the playback location of the cross direction of said servo pattern with the servo pattern signal outputted from said detection means.

[0016] Moreover, let said verification means be verification equipment of the servo pattern of the tape which detects the playback location of the cross direction of said servo pattern based on the migration control signal which is a signal for moving said transducer outputted from said control means.

[0017] Moreover, let said control means be verification equipment of the servo pattern of the tape made to move said transducer crosswise [of said servo pattern] irrespective of whether detection of a record defect was performed by said verification means.

[0018] Moreover, it sets to the verification equipment of the servo pattern of the tape for verifying the record condition of the servo pattern which consists of a pattern of the specific dimension recorded on the tape. The control means which controls the whole equipment, and the tape driving means for making it run said tape, The transducer which detects the signal of said tape to said servo pattern from said tape it is running by width of face narrower than the width of face of the pattern of said servo pattern, A detection means to detect the servo pattern signal corresponding to said servo pattern based on the signal outputted from said transducer, A verification means to verify the record condition of said servo pattern based on said servo pattern signal outputted from said detection means, It consists of transducer migration means to which said transducer is moved to said servo pattern so that the playback location of the cross direction of said servo pattern may change by moving said transducer based on the migration control signal outputted from said control means. Let said verification means be verification equipment of the servo pattern of the tape characterized by making it relate to the playback location of the longitudinal direction of said servo pattern by said transducer, and verifying the record condition of said servo pattern.

[0019] Moreover, the servo pattern recorded on said tape includes the information on the location of the longitudinal direction of said tape, and let said verification means be verification equipment of the servo pattern of the tape which detects the location of the longitudinal direction of said servo pattern with the servo pattern signal outputted from said detection means.

[0020] Moreover, let said verification means be verification equipment of the servo pattern of the tape which detects the location of the longitudinal direction of said servo pattern based on the information on the location of the longitudinal direction of said tape obtained from said tape driving means.

[0021] Moreover, it sets to the verification equipment of the servo pattern of the tape for verifying the record condition of the servo pattern which consists of a pattern of the specific dimension recorded on the tape. The control means which controls the whole equipment, and the tape driving means for making it run said tape, The transducer which detects the signal of said tape to said servo pattern from said tape it is running by width of face narrower than the width of face of the pattern of said servo pattern, A detection means to detect the servo pattern signal corresponding to said servo pattern based on the signal outputted from said transducer, A verification means to verify the record condition of said servo pattern based on said servo pattern signal outputted from said detection means, It consists of transducer migration means to which said transducer is moved to said servo pattern so that the playback location of the cross direction of said servo pattern may change by moving said transducer based on the migration control signal outputted from said control means. Let said verification means be verification equipment of the servo pattern of the tape characterized by making it relate to the playback location of the cross direction of said servo pattern by said transducer, and a longitudinal direction, and verifying the record condition of said servo pattern.

[0022] Moreover, it sets to the verification equipment of the servo pattern of the tape for verifying the record condition of the servo pattern which consists of a pattern of the specific dimension recorded on the tape. The control means which controls the whole equipment, and the tape driving means for making

it run said tape, A servo pattern record means to record said servo pattern on said tape, It is arranged about the transit direction of said tape on the lower stream of a river of said servo pattern record means. The transducer which detects the signal of said tape to said servo pattern from said tape it is running by width of face narrower than the width of face of the pattern of said servo pattern, A detection means to detect the servo pattern signal corresponding to said servo pattern based on the signal outputted from said transducer, A verification means to verify the record condition of said servo pattern based on said servo pattern signal outputted from said detection means, It consists of transducer migration means to which said transducer is moved to said servo pattern so that the playback location of the cross direction of said servo pattern may change by moving said transducer based on the migration control signal outputted from said control means. Let said verification means be verification equipment of the servo pattern of the tape characterized by making it relate to the playback location of the cross direction of said servo pattern by said transducer, and verifying the record condition of said servo pattern.

[0023] Moreover, it sets to the verification equipment of the servo pattern of the tape for verifying the record condition of the servo pattern which consists of a pattern of the specific dimension recorded on the tape. The control means which controls the whole equipment, and the tape driving means for making it run said tape, A servo pattern record means to record said servo pattern on said tape, It is arranged about the transit direction of said tape on the lower stream of a river of said servo pattern record means. The transducer which detects the signal of said tape to said servo pattern from said tape it is running by width of face narrower than the width of face of the pattern of said servo pattern, A detection means to detect the servo pattern signal corresponding to said servo pattern based on the signal outputted from said transducer, A verification means to verify the record condition of said servo pattern based on said servo pattern signal outputted from said detection means, It consists of transducer migration means to which said transducer is moved to said servo pattern so that the playback location of the cross direction of said servo pattern may change by moving said transducer based on the migration control signal outputted from said control means. Let said verification means be verification equipment of the servo pattern of the tape characterized by making it relate to the playback location of the cross direction of said servo pattern by said transducer, and a longitudinal direction, and verifying the record condition of said servo pattern.

[0024]

[Embodiment of the Invention] Drawing 1 is a block diagram explaining the configuration of the whole mode of operation of this invention. 1 is a tape driving means. 2 is a tape. A tape 2 runs in the direction shown in an arrow head 5 towards a take up reel 4 from the supply reel 3. 6 is the transducer slack reproducing head. The reproducing head 6 is in contact with the tape 2, and reproduces a signal from the magnetization pattern of a tape 2. 7 is a detection means. The detection means 7 detects the signal reproduced from the reproducing head 6. 8 is a verification means. The verification means 8 verifies the signal which is related to the location of the cross direction of a tape 2, the location of a longitudinal direction, or width of face and the location of both straight side, and is outputted from the detection means 7. 9 is a transducer migration means slack head migration means. The head migration means 9 moves the reproducing head 6 crosswise [of a tape 2]. 10 is a control means. A control means 10 controls the whole verification equipment of the servo pattern of the tape shown in drawing 1 . 11 is a record means. The record means 11 records the result of verification of the verification means 8.

[0025] Drawing 2 is drawing having shown migration of the reproducing head 6, and the relation of a tape 2. In drawing 2 (a), 12 is a servo pattern. the servo pattern 12 -- a tape 2 -- it is mostly recorded in the center by the longitudinal direction by the recording width W. The reproducing head 6 always touches the tape 2. The reproducing head 6 is equipped with the head chip 13 for reproducing the servo pattern 12. The reproducing head 6 and the head migration means 9 are mechanically combined by the link 14. A link 14 is driven crosswise [of a tape 2] with the head migration means 9. Consequently, the reproducing head 6 is movable to the cross direction of a tape 2. The head migration means 9 is realizable with the voice coil motor and stepping motor which are not illustrated.

[0026] Drawing 2 (b) is drawing which expanded near the head chip 13 of drawing 2 (a). The head chip 13 equips the magnetic path 15 with the opening 16. The width of face of the longitudinal direction of

the tape 2 of a magnetic path 15 is fully narrow as compared with the recording width W of the servo pattern 12. Therefore, the whole width of face W is a part very much, for example, the servo pattern 12 reproduced with the head chip 13 is about 1/60. The servo pattern 12 consists of four basic pattern groups, A1, B1, A2, and B-2. A1 and A2 lean from the line of a right angle 6 times clockwise to the longitudinal direction of a tape 2, and B1 and B-2 lean 6 times counterclockwise. As for A1 and B1, four patterns are located in a line, and, as for A2 and B-2, three patterns are located in a line. Moreover, it is mutually separated from each pattern group of A1, B1, A2, and B-2 so that it may not lap. Repeat record of 4, these A1, B1 and A2, and B-2, 4, 3, and the three patterns is carried out without the joint covering the overall length of a tape 2.

[0027] Drawing 3 is the relation of the location of the servo pattern 12 and the head chip 13, and is drawing explaining the principle which can distinguish the location of the width of face W of the servo pattern 12. Now, the head chip 13 presupposes that the line top shown by the line 17 the line top shown by the line 16 of drawing 3 (a) among the width of face W of the servo pattern 12 was scanned. If it does so, when the output of the detection means 7 scans a line 16 top, an output like drawing 3 (b) is obtained, and when a line 17 top is scanned, an output like drawing 3 (c) will be obtained. In drawing 3 (b), a time interval T1 is a time interval of the signal of the last of the pattern group A1, and the signal of the beginning of the pattern group B1. T2 is the time interval of the last of B1, and the beginning of A2 similarly, T3 is the time interval of the last of A2, and the beginning of B-2, and T four shows the time interval of the last of B-2, and the beginning of A1. Moreover, T5 of drawing 3 (c) is a time interval corresponding to T1, and T6 is a time interval corresponding to [in T8 / corresponding to T3 in T7] T four to T2. And when T8 is compared with T1, T5, T2, T6 and T3, and T7 and T four, it turns out that the numeric values of each time interval differ. If the physical dimension on the tape 2 of the servo pattern 12 which the travel speed of the tape 2 shown in drawing 1 is correctly controlled, and was shown in drawing 2 is managed correctly and ones from T1 to T8 of time intervals will be measured, it is possible for the head chip 13 to reproduce the location of what in the recording width W of the servo pattern 12 in drawing 2 (b), and to distinguish **.

[0028] Drawing 4 is the explanatory view having shown the example of the mode of the record defect of the servo pattern 12, and the output signal of the detection means 7. There are two in the mode of a record defect. One is lack of a pattern and one is the appearance of a pattern with excessive others. With the continuous lack, lack of a pattern may be intermittently missing. The appearance of an excessive pattern is that the pattern detected as a signal exists in the location where a pattern originally should not exist, for example, the noise when recording, the defect of the material of the record medium of a tape 2, etc. become a cause. As for whether it is or the record defect which cannot carry out permission it is a permissible record defect in any case of whose, it is common that the numeric value used as a limitation is decided for every class of tape 2 with the specification which defined the servo pattern.

[0029] Drawing 4 (a) shows the example in the appearance of a pattern with the servo pattern 12 as excessive in the range of a recording width W as lack of a pattern. The example for which the head chip 13 shown in drawing 2 is reproducing the location of a line 18 is the case where excessive patterns other than servo pattern 12 are recorded, although it is satisfactory to the record of the servo pattern 12 itself. The excessive pattern is recorded on the location shown by 40 of the location of a line 18. Consequently, from the detection means 7, as shown in drawing 4 (b), all the pattern groups of A1, B1, A2, and B-2 are reproduced, and the noise signal 41 corresponding to the excessive pattern 40 is also reproduced. Since the pattern groups A1 and A2 are the record defects by pattern lack when the head chip 13 is reproducing the location of a line 19, as shown in drawing 4 (c), the output corresponding to the pattern groups A1 and A2 is not obtained from the detection means 7. Moreover, since the pattern group B1 and B-2 are the record defects by record lack when the head chip 13 is reproducing the location of a line 20, as shown in drawing 4 (d), the output corresponding to the pattern group B1 and B-2 is not obtained from the detection means 7.

[0030] Drawing 5 explains actuation of the verification means 8 shown in drawing 1. Drawing 5 (a) shows the outline of the servo pattern 12 of a recording width W. Drawing 5 (b) is the example of the output of the detection means 7 when the head chip 13 runs the location shown in the line 21 of drawing

5 (a). Drawing 5 (c) is the example of the output of the detection means 7 when the head chip 13 runs the location shown in the line 22 of drawing 5 (a). If drawing 5 (b) and drawing 5 (c) are seen, it is common with the output of the detection means 7 that the pattern corresponding to the pattern groups A1, B1, and A2 and B-2 in any case is repeated. That is, the pattern corresponding to drawing 5 (b) is a pattern like drawing 5 (d), and the pattern corresponding to drawing 5 (c) is a pattern like drawing 5 (e). It turns out that it is the repeat of the group of the pulse of 4, 4, 3, and 3 also with the pattern shown in drawing 5 (d) and (e). Then, the verification means 8 sets up one repeat pattern as one frame f. Although the location of the arbitration on a tape 2 is sufficient as the start edge of Frame f, once it sets up the start edge of Frame f on a tape 2, the location and die length of Frame f have the property to decide covering the overall length of a tape 2. Drawing 5 shows the example which set up the start edge of Frame f between pattern group B-2 and the pattern group A1. Moreover, the location and die length of Frame f on a tape 2 do not change, even if the head chip 13 is reproducing the location of servo pattern 12 throat.

[0031] However, in fact, when determining the location and die length of Frame f, the verification means 8 is determined from the signal relevant to a servo pattern record means 42 to record the servo pattern later mentioned through a control means 10, or is determined from the output signal of the detection means 7. For example, if the case where it generates from the output signal of the detection means 7 is explained, in the case of the frame f shown in drawing 5 (d) and (e), the verification means 8 will always supervise the output of the detection means 7, and the timing between pattern group B-2 and the pattern group A1 will be measured each time. And even if the verification means 8 is the case where the output of the detection means 7 is disrupted, presumption of the location of a certain amount of frame f of it is attained with the mileage of the tape 2 obtained from the tape driving means 1. The verification means 8 compares the pattern predicted on every frame f with the pattern of the signal actually outputted from the detection means 7, and verifies the signal outputted from the detection means 7. When there is no pattern of a normal signal between Frames f or there is an excessive signal as shown in drawing 4 (b), the verification means 8 is detected as a record defect.

[0032] Drawing 6 is the block diagram having shown the configuration of the detection means 7 shown in drawing 1, and the verification means 8. The clock playback section 23 and the data detecting element 24 can constitute the detection means 7. The clock playback section 23 reproduces the clock signal included in the signal reproduced from the reproducing head 6. The data detecting element 24 detects data out of the output signal of the reproducing head 6 based on the clock signal reproduced by the clock playback section 23.

[0033] The verification means 8 consists of the data playback section 25, a record defective detecting element 26, a direction location detecting element 27 of Y, a direction location detecting element 28 of X, etc. The data playback section 25 decides the location of the signal outputted from the detection means 7, and outputs a data signal. A means as showed the signal which shows the record defect included in the data signal outputted from the data playback section 25 to drawing 5 detects the record defective detection means 26. The direction location detecting element 27 of Y detects the location of the cross direction of the tape 2 of the head chip 13 in the servo pattern 12 of a recording width W. That is, as shown in drawing 3, it is detectable in which location the head chip 13 is to the servo pattern 12 of a recording width W, if a data signal is measured. The direction location detecting element 28 of X detects the location of the longitudinal direction of a tape 2. accumulation of the frame f which showed detection of the location of the longitudinal direction of a tape 2 to drawing 5 -- it is detectable with counting.

[0034] Moreover, absolute-address attachment covering the overall length of a tape 2 is possible by modulating spacing of the pulse of the pattern group A1 or B-2 shown in drawing 2 in the required range with the data signal showing the address on a tape 2. In this case, the direction location detecting element 28 of X detects the absolute address of a tape 2. moreover -- the time of a normal signal not being outputted from the detection means 7 by the data signal with which the address on a tape 2 is expressed while the signal is normally outputted from the detection means 7, since the direction location detecting element 28 of X pinpoints the location of the direction of X of a tape 2 -- the mileage of a tape

2 -- being based -- accumulation of Frame f -- naturally it is also possible to carry out mutually with a change by counting. Furthermore, when the signal from a means to record the servo pattern mentioned later is generating Frame f, the decision of the location of the direction of X is possible irrespective of the existence of a signal.

[0035] 43 shown in drawing 6 is a clock feed zone. The clock feed zone 43 can supply a clock required for reception, the data detecting element 24, the data playback section 25, the record defective detecting element 26, the direction location detecting element 28 of X, etc. for the clock which serves as criteria from a control means 10 by line 44 course. When the control means 10 includes the configuration which records the servo pattern 12 on a tape 2, detection of the stable record defect and detection of the direction of X of 1 are possible by carrying out to the clock used for record of the servo pattern 12 in common.

[0036] Drawing 7 is drawing explaining actuation of the control means 10 shown in drawing 1, the head migration means 9, and the reproducing head 6. A control means 10 moves the reproducing head 6 in the height direction (X shaft orientations) of the servo pattern 12 by controlling the head migration means 9. 29, 30, 31, 32, 33, 34, 35, 36, and 37 of drawing 7 show the location through which the head chip 13 of the reproducing head 6 passes to the servo pattern 12. For example, playback is begun from the location of 29 at first, after a tape 2 runs to some extent, it moves to the location of 30, and sequential migration is carried out henceforth, and the head chip 13 results to the location of 37. The approach of migration may move from the location of 29 gradually to the location of 37 one by one, and may be migration of a stepless story from the location of 29 to the location of 37. if it reaches to the location of 37 -- if -- a control means 10 turns and moves the head chip 13 to the location of 29 again.

[0037] When the recording width of the servo pattern 12 is W, there are few parts actually used than W. The part to which this touches the both ends of a recording width W is because the magnetization pattern is unstable. The one larger than the range actually used desirably of the playback range of the head chip 13 is good. Moreover, as for the signal outputted from the detection means 7, the signal with which the location of the head chip 13 shows many record defects which mainly show lack of a signal near the edge of a recording width W is included. The verification means 8 goes into the range in which the head chip 13 is actually used, or should just verify from the detection means 7 in the range whose signal which shows a record defect from the output of a signal decreases. Although the record means 11 records a verification result, what is actually recorded does not need to be the total displacement range of the head chip 13, and it is good in the range with the need of recording a verification result. A control means 10 controls the head migration means 9, supervising the output signal of the detection means 7, as shown in drawing 1. However, the signal outputted from the detection means 7 may not be a normal output by the location or the actual record defect of the head chip 13. A control means 10 is not based on the existence of the output of the detection means 7, but controls the head migration means 9, and it constitutes it so that the reproducing head 6 may be moved.

[0038] The mode of operation of this invention can consider various configurations. For example, although the example of the verification equipment of the servo pattern of a tape is shown in drawing 1, it may be practical to also make the recording device of a servo pattern make it serve a double purpose. In drawing 1, 38 is a pattern record means and 39 is a recording head. The pattern record means 38 and a recording head 39 constitute a servo pattern record means 42 to record a servo pattern. A recording head 39 is in the upstream of the reproducing head 6 about the transit direction 5 of a tape 2. Consequently, the servo pattern 12 is reproduced by the reproducing head 6 immediately after recording the servo pattern 12 on a tape 2 by the recording head 39. By doing in this way, the servo pattern 12 can be recorded and the right magnetic tape which verified the record condition of the servo pattern 12 to coincidence can be produced. Therefore, compared with the case where carry out servo pattern **** record first at a tape 2, and a servo pattern is verified at another process after that anew, the productive efficiency of a tape is high. In addition, a control means 10 generates the record pattern signal of the servo pattern 12, and the pattern record means 38 amplifies the record pattern signal, and it supplies it to a recording head 39.

[0039] Since other advantages of having the servo pattern record means 42 become possible

[reproducing by the reproducing head 6 immediately after recording the servo pattern 12 on a tape 2 by the recording head 39], they are in the place which can predict the signal which should be reproduced by the reproducing head 6. If the verification equipment and the recording device of a servo pattern of a tape are constituted as one, since supply can be received for the signal equivalent to a clock signal from a control means 10, the clock playback section 23 of the detection means 7 shown in drawing 6 is unnecessary, and can simplify a configuration. Moreover, if the write-in signal of the servo pattern 12 can be referred to from a control means 10, since the verification means 8 can also carry out the direct reference of the servo pattern 12 recorded on the tape 2, it becomes possible [simplifying the configuration of the data playback section 25, the record defective detecting element 26, the direction location detecting element 27 of Y, and the direction location detecting element 28 of X].

[0040] The record means 11 of drawing 1 is recorded on the memory and the record medium which do not illustrate the output of the record defective detecting element 26 shown in drawing 6 , and the direction location detecting element 27 of Y, or the output of the direction location detecting element 28 of X. Moreover, if required, the result can also be written in tape 2 the very thing. Moreover, in the mode of the above operation, the servo pattern 12 showed the example recorded as a magnetization pattern on a tape 2. However, this invention can be carried out, also when it is not necessary to be a magnetization pattern and is optical record. When it is an optical servo pattern, the optical head which is not illustrated instead of the reproducing head 6 as a transducer is used.

[0041]

[Effect] As mentioned above, if this invention is carried out, when manufacturing the tape on which the servo pattern was recorded, the record defect of a servo pattern can be verified and it is effective on industry.

[Translation done.]